Malin Daase

Institut für Meereskunde an der Universität Kiel

Distribution of Zooplankton in relation to biophysical gradients associated with frontal systems.

The purpose of this work was to study the composition and distribution of the zooplankton community across a frontal zone north of Svalbard in order to determine if any patterns can be associated with differences in the distribution of water masses in the study area.

During a cruise with RV 'Jan Mayen' in September 2000 the physical properties were registered along a transect which crosses the front north of Svalbard. At 4 stations stratified vertical zooplankton hauls were taken between 400 and 0m. All zooplankton species from the samples were identified and their abundance estimated. In addition the copepodite stages of *Calanus* spp. and *M.longa* were identified.

Water masses originating in the Arctic and water masses from the Atlantic meet in the study area. These water masses could be distinguished by means of temperature. The two northern most zooplankton sampling stations were located in predominately Arctic influenced water masses while the water at the southern stations was influenced by the Atlantic.

Copepods were found to be the most common components of the zooplankton community in the study area. The most abundant species were *Oithona similis*, *Oncaea borealis*, *Microcalanus* spp., *Calanus finmarchicus*, *Pseudocalanus* spp. and *Metridia longa.*

Differences in species composition and distribution, which can be related to the distribution of the water masses, were observed. To the north of the front species described as Arctic dominated while the abundance of species characteristic for Atlantic waters was higher in the south.

The dominant herbivorous *Calanus* spp. and the omnivore *M.longa* showed differences in their development across the front. Older stages made up a greater fraction of the population in the south while in the north the abundance of younger stages was higher. The descent of *Calanus* spp. to over wintering depth seemed to have started as indicated by the relative higher abundance of older copepodite stages in deeper water layers in the southern stations compared to the northern stations. These differences in development are most likely due to temperature differences between Atlantic influenced water and Arctic water masses.

There were no remarkable differences in the vertical distribution of most species between the two sides of the front. Thus the vertical distribution of most species seemed to be less influenced by the water mass distribution. Abundance was maximal at the surface layer at all stations but most species occurred in deeper layers. *Calanus* spp. and *M.longa* showed a stage specific depth distribution, which varied across the front due to differences in their developmental state. Indications of diel vertical migration were found in *M.longa* and some other species. *Calanus* spp. showed no signs of diel vertical migration.

Changes in the optical properties across the front as observed in the Norwegian Sea and the Greenland sea could not be detected in the study area. It is not possible to tell if this is due to the season or the used methods or if this is a general trend at the frontal zone north of Svalbard.

malin.daase@unis.no